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DECEMBER 1983

COMPUTER DECISIONS

THE MANAGEMENT MAGAZINE OF COMPUTING

A HAYDEN PUBLICATION

Maintenance alternatives

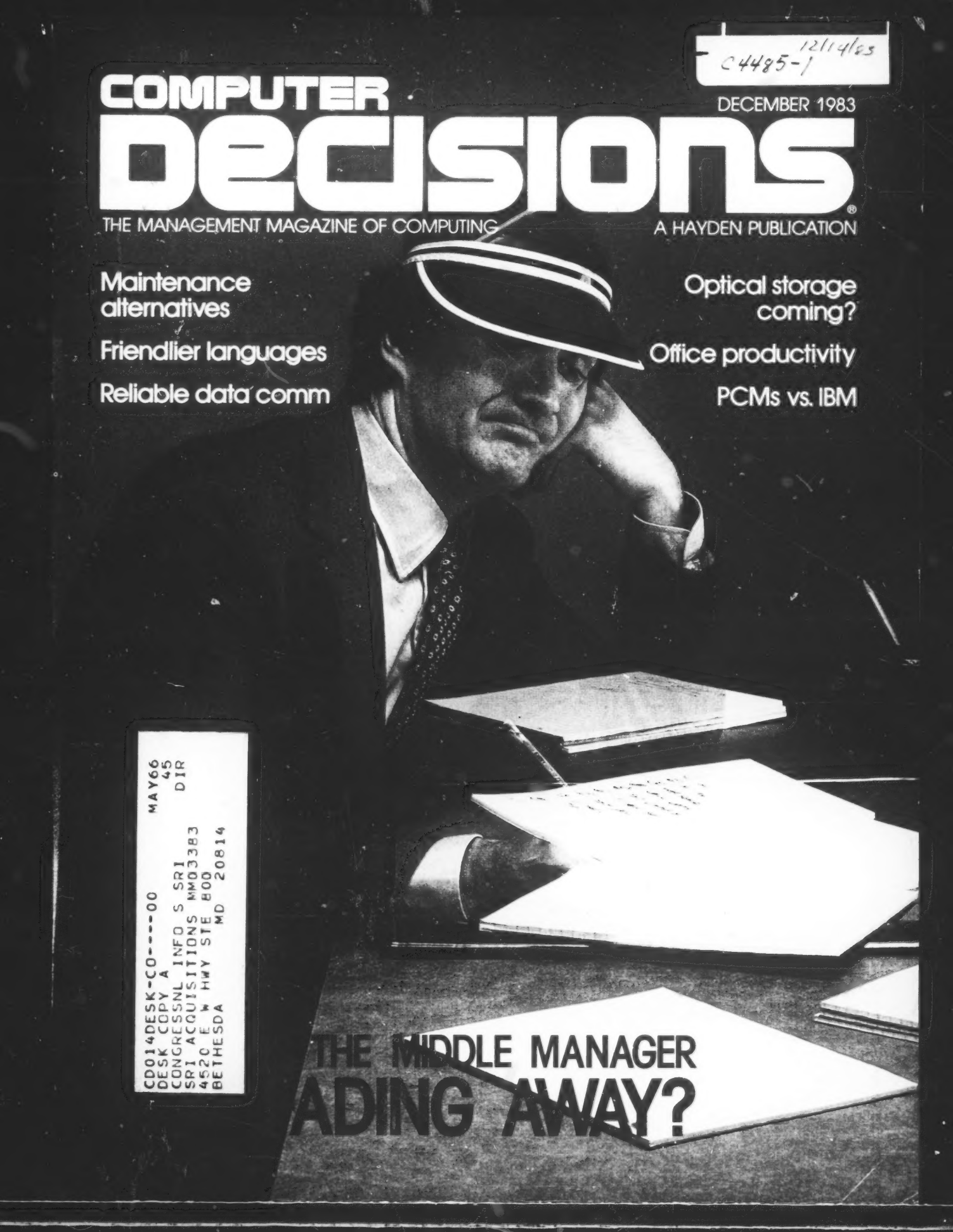
Friendlier languages

Reliable data comm

Optical storage coming?

Office productivity

PCMs vs. IBM



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COMPUTER DECISIONS

THE MANAGEMENT MAGAZINE OF COMPUTING

DECEMBER 1983

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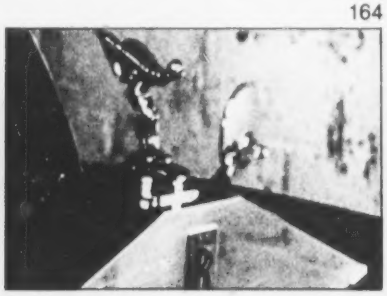

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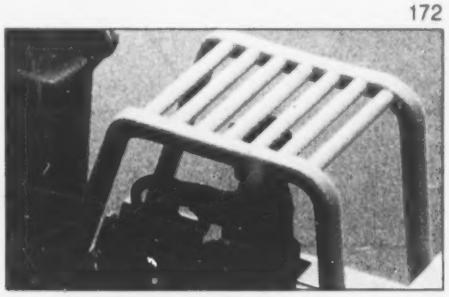

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COVER PHOTO: Bill Oliwa

OFFICE AUTOMATION

And the race goes on—Part I

The proliferation of office-automation vendors, coupled with an aggressive marketing climate, is probably only adding to your confusion about choosing a primary supplier of hardware. Indeed, potential users are being bombarded by relentless marketing teams that, quite obviously, are more than willing to demonstrate how much better their "bells and whistles" are than the competition's offerings. Which one of these eager-to-please suitors should you choose? Your choice depends on a variety of criteria. But one important question to consider in the decision-making process—perhaps the *most* important—is: Will the vendor be available to service its equipment in the years to come? Or, more to the point: Will the vendor be able to survive in the increasingly competitive climate?

Last year, recognizing just how important consideration of this question is, *Computer Decisions* surveyed 75 office-automation consultants and managers of OA projects about the survivability of well-known vendors. Twenty-two experts responded. Results were published in the January and February 1983 issues.

The focus of the survey was five years into the future—early 1988. Each respondent was asked to check one of three ratings for each vendor named (there were 34 vendors in all). The choice of ratings included "sure survivor," "likely survivor," and "not likely." In tallying results, a "weight" of 10 was assigned to each "sure survivor" vote, 6 to each "likely survivor" vote, and 2 to each "not likely." The highest possible score any vendor could attain was 220. However, no vendor received that score because not all respondents rated every vendor.

This year, the process was repeated, focusing on 38 vendors in the year 1989. In cooperation with the Office Automation Society International, we surveyed its members, and received a total of 36 responses by the September 15 deadline, in comparison to last year's 22. Also like last year's survey, this year's covered two separate categories. This month, we're presenting results on vendors supplying Fortune 1,000 organizations. We'll give a similar report in next month's issue, covering the major suppliers to single-site operations.

The chart that accompanies this report provides total scores for each vendor, as well as the number of "sure survivor" votes each received. The chart also compares current scores for each company with last year's scores. The highest possible rating any vendor could receive this year was 360. As in last year's survey, no vendor received a perfect score because not all respondents rated every vendor.

> As in last year's survey, no vendor got a perfect score, because not all respondents rated every vendor.

The "Top 10" roster of vendors was almost completely predictable. In rank order of total scores they are: IBM (342); Digital Equipment (DEC) (298); Wang Laboratories (288); Hewlett-Packard (284); AT&T Information Systems (272); Apple Computer (250); Xerox (244); Honeywell (234); Kodak (220); and Northern Telecom (206).

Again, as in last year's survey, IBM ran away with the race. Thirty-three of the 36 respondents rated Big Blue a "sure survivor."

Digital Equipment moved up from fourth place last year to second. According to some respondents, DEC's entrance into the personal-computer market—although a little late—and its commitment to a more aggressive marketing strategy, were responsible for the quick attainment of its higher standing. Twenty-eight of those surveyed rated DEC a "sure survivor."

Wang Laboratories was nosed out of second place into the third slot by only three "sure survivor" votes—it received 25 notches in that category.

Hewlett-Packard was a "dark horse," as it moved up from sixth place in last year's competition to fourth this year. It garnered 23 "sure survivor" votes and nine "likely survivor" votes, overtaking AT&T Information Systems and Xerox along the way. Although AT&T holds a lower position than in last year's race (it was third), confidence still runs high that it will be a contender five years from now. AT&T received 23 "sure survivor" and seven "likely survivor" votes.

Apple Computer took sixth place, with a total of 16 "sure survivor" votes. At first glance, such a high rating might seem surprising, considering the industry giants surrounding the young contender. However, according to some of the survey respondents, Apple machines have found their niche as executive terminals for staff officers. Thirteen "likely survivor" votes and six "not likely" votes are added to Apple's score.

If the tallies are any indication, respondents have mixed feelings about Xerox. First of all, it dropped from fifth place in last year's race to seventh place. Second, although it collected 18 "sure survivor" votes and 10 "likely survivor," two respondents

felt the vendor might not be selling to the Fortune 1,000 in 1989.

Honeywell and Northern Telecom kept their places at the low end of the "Top 10," but a newcomer to the survey—Kodak—managed to squeeze in between the two and claim ninth place. It gathered 16 "sure survivor," nine "likely survivor," and three "not likely" votes.

Perhaps you work for a smaller, single-site company. In that case, you'd probably be more interested in what the experts have to say next month. Stick around. □

"Survivor" survey results

Company*	Total score 1989	"Sure survivor" votes 1989	Total score 1988	"Sure survivor" votes 1988
Anaconda-Ericson	74	0	—	—
Anderson Jacobson	124	3	52	1
Apple Computer	250	16	104	5
AT&T Information Systems	272	23	178	16
Bell & Howell	158	5	—	—
Burroughs	196	9	98	0
CPT	120	2	78	0
Data General	196	8	74	0
Datapoint	162	3	82	0
A. B. Dick	124	3	48	1
Dictaphone**	168	7	66	1
Digital Equipment	298	28	172	14
Exxon Office Products	160	8	44	0
Hewlett-Packard	284	23	134	8
Honeywell	234	13	106	2
IBM	342	33	206	20
Kodak	220	16	—	—
Lanier	172	7	90	2
Motorola (Four Phase)	134	6	74	1
NBI	120	4	92	1
NEC	144	9	70	0
Nixdorf	72	1	46	0
Northern Telecom	206	14	102	5
Olivetti	112	3	72	1
Philips (Micom)	110	6	78	0
Prime	152	5	80	2
Raytheon (Lexitron)	88	2	66	0
Rolm	152	8	98	4
Royal	106	3	46	0
Sony	162	8	70	1
Sperry	196	11	84	0
Syntrex	78	1	48	0
Tandem	142	4	80	0
Tandy (Radio Shack)	160	5	70	3
3M	190	12	—	—
Wang	288	25	194	17
Wordplex	60	1	38	0
Xerox	244	18	164	11

*These results show which vendors members of the Office Automation Society International think will be serving the Fortune 1,000 corporations in five years. Vendors that received write-in votes from respondents include CPI, Kaypro, Siemens, and Texas Instruments.

**In October, Dictaphone announced its withdrawal from the word-processing business.

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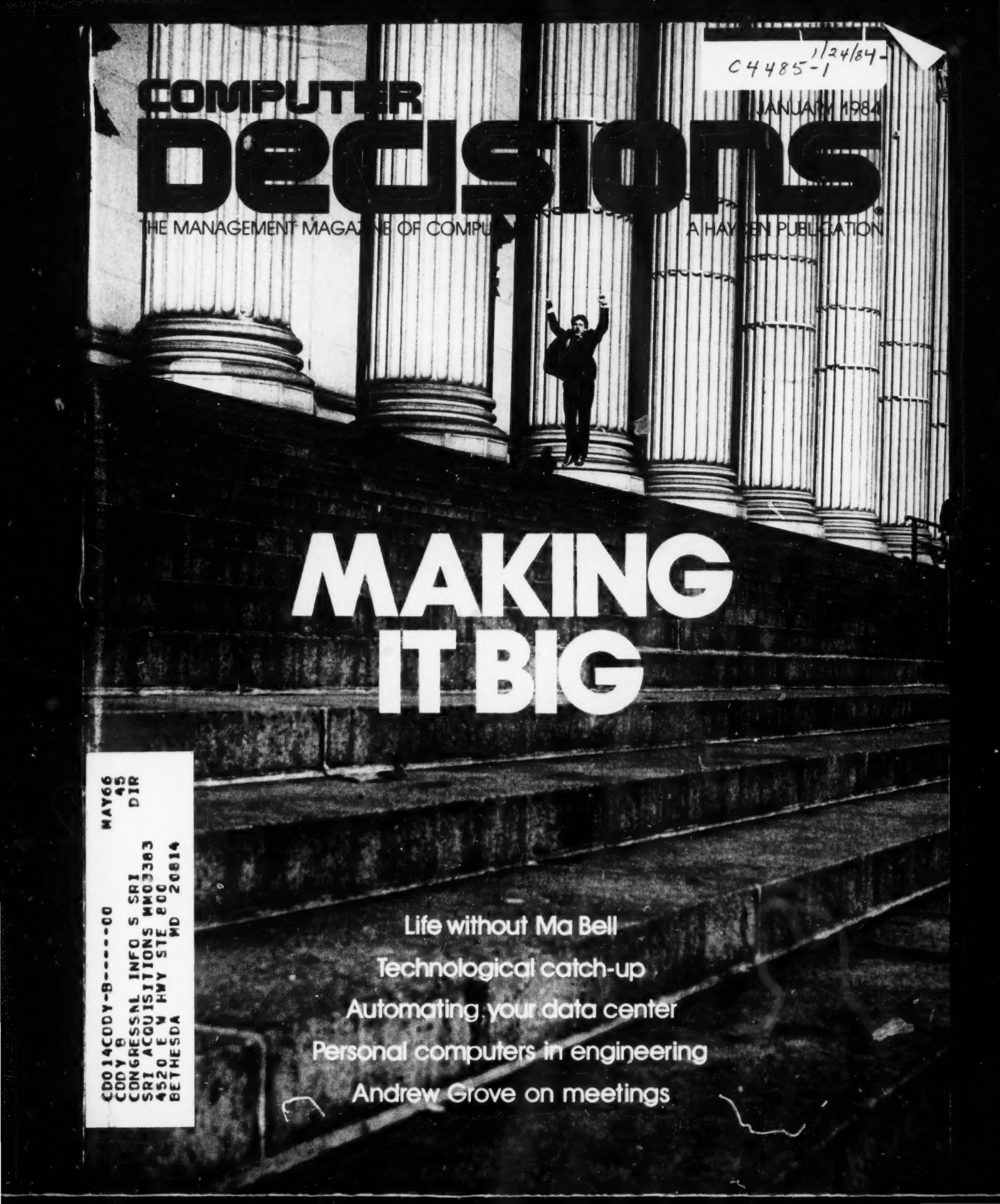

MAKING IT BIG

Life without Ma Bell

Technological catch-up

Automating your data center

Personal computers in engineering

Andrew Grove on meetings

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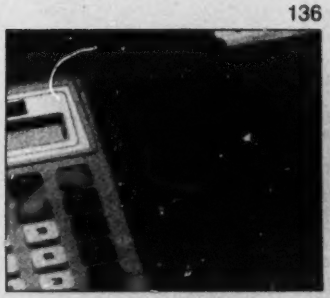

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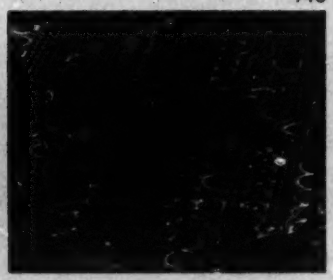

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COVER PHOTO: Edward Hardin

news & comment

Are corporate micros underused?

Are personal computers in corporations being used to capacity? A new survey of managers and employees in Fortune 500 companies suggests that capacity has very different meanings to the two groups.

In the survey, 80 percent of the 100-manager sample said their organizations' personal computers aren't being used to full capacity. Only 12 percent said users were fully utilizing the machines.

However, the 100 users included in the survey disagreed. More than half (53 percent) said they use their personal computers as much as initially expected, and 42 percent said the machines are being used more than anticipated.

The survey was conducted last August for Control Data Corp. (Minneapolis) by Penn + Schoen Associates, a New York research house. It examines the beliefs and attitudes of 100 management-information systems (MIS) managers, 100 employees who use personal computers on the job, and 100 employees who don't use microcomputers at work.

Utilization is often raised as an issue in corporate personal-computer deployment. Indeed, some organizations require prospective users to project the number of hours they'll use personal computers before purchases are approved.

The managers in the survey clearly believe users can do a good deal more with personal computers. But managers don't seem to be overly concerned about taking action to improve utilization. Only 6 percent of the respondents said they are dissatisfied with their organizations' personal computers. Seventy-eight percent are satisfied.

The most popular personal-computing application among user respondents was doing budgets, with "spreadsheet analysis" finishing a close second. As the accompanying chart demonstrates, employees are using their machines for a variety of tasks.

Fifty-nine percent of the sample said they've expanded their duties using personal computers. The managers haven't realized such impressive on-the-job gains. Only 11 percent said their workload had been reduced by personal computers, while 53 percent noticed no change.

Based on the responses from the three groups in the survey, Penn + Schoen concluded that managers and employees alike don't fully understand personal computers in a corporate setting. Many managers and users need better insight into how personal computers can be integrated into existing information-processing systems in a tailor-made arrangement.

Of course, as a vendor of databases, Control Data's interest in the survey is in managerial and user attitudes toward databases. Among MIS managers, 46 percent said they didn't think their departments were using all available database services. However, 27 percent of the managers discouraged use of such services.

Most-popular micro applications

	Percent performing task	Hours saved		
		2	3–5	6+
Calculating budgets	63	64%	15%	6%
Spreadsheet analysis	58	65	15	10
Preparing lengthy documents	52	59	15	8
Reviewing records	32	59	24	10
Accounting	31	71	18	8
Market-analysis reporting	27	76	16	0
Interoffice memos	23	75	15	5
General research	22	72	6	17

IBM PC is conquering OA

Major vendors of office systems are moving to connect the IBM Personal Computer to their systems. The "PCing of the automated office" was one of the trends revealed at the recent Hammer/Seybold Forum on office systems and professional computing.

The IBM PC is "the most important development in office automation of the past five years," David Klein, executive vice president of NBI Inc., told the conference. IBM's machine is nettlesome for NBI, a Boulder, CO-based supplier of word-processing systems. Klein said that some user organizations have more PCs hooked to shared-resource systems made by NBI than they do NBI workstations.

Tying office-automation systems to IBM mainframes is the other major thrust in current office automation. One vendor after another has revealed plans to tie equipment into IBM's various communications protocols or document-sharing schemes.

IBM standards are not the only ones gaining support. Executives from AT&T Information Systems (New York) and Digital Equipment

16-bit processors, 128 Kbytes of memory, or a color monitor received extra points. If a display or keyboard was not included with the basic system, the machine lost points.

The Guide costs $20. For more information, call The Management Training Institute Inc. at (301) 881-7666.

Walking fingers

The FM/3000 productivity systems for minicomputers, from Computer Solutions, can now be accessed by the touch-screen Hewlett-Packard 150 personal computer. Users can literally walk through the systems' menus and databases with their fingers.

FM/3000 includes programs for manufacturing-resource planning, inventory control, accounts receivable, accounts payable, sales-order processing, and general ledger. A version for marketing is called FM/3000 Plus.

The HP 150-link package offers three new features: Browse, Help, and Executive Inquiry. Each can be activated via the touch screen. Browse lets a user scroll alphabetically or numerically through all the files in a database. Help can be activated at any point in an operation; its function is self-explanatory. Executive Inquiry lets users pose any one of 20 questions to the database.

A version of FM/3000 that runs on HP 3000 minicomputers costs $40,000. FM/3000 Plus costs $55,000. Timesharing is also available. For more information, contact Computer Solutions at (617) 229-2200.

Users rate small systems

Users of small systems aren't happy about the trend away from traditional on-site maintenance for small systems. According to a survey of 251 managers by Input, Mountain View, CA, managers would rather go the traditional route. Fourteen vendors were covered. Apparently, new methods of providing service that give users more responsibility dissipate the lines of communication between managers and vendors.

Responding managers said they need better service than vendors are providing. Software service did not rate as highly as service for hardware. As expected, managers gave low marks to documentation. Because documentation usually is given low priority during the product-development cycle, late delivery of documents is common and quality is generally poor. Another problem is that the documentation is usually written in technical language. Many managers said they need plain English. In an attempt to remedy this problem, some vendors have merged engineering and sales groups, creating documentation departments.

Respondents included company presidents, managers, and analysts employed by organizations with from $1 million to $1 billion in annual sales. Only 15 of the respondents were corporate officers. By far, the greatest number had the title of "manager." The survey was conducted last summer.

Service ratings on small systems

Vendors	Service image	Software service	Problem diagnosis
Autotrol	6.19	5.00	6.81
Burroughs	6.77	6.55	7.10
Computervision	7.32	6.21	7.32
Digital Equipment	8.03	7.30	7.87
Data General	8.03	8.56	8.10
Datapoint	7.65	7.27	7.45
Four Phase	7.40	6.65	7.60
Hewlett-Packard	7.70	7.05	7.37
Honeywell	7.40	6.50	7.67
IBM	8.25	7.79	8.21
Intergraph	7.15	6.22	7.45
NCR	7.57	6.27	7.43
Prime	8.05	7.27	7.55
Texas Instruments	7.35	7.40	7.84
All vendors	7.54	6.79	7.60

Small-systems users in the Input survey were asked to rate vendors on a scale of 1 to 10 in three categories: overall service image, ability to maintain software, and ability to diagnose and repair hardware problems. The chart lists the mean ratings. Reprinted by permission of Input.

Rolm looks ahead

Communications technology may be changing rapidly, but Rolm Corp. has designed its new digital switch to last through the end of the millennium. The CBX II private automatic branch exchange (PABX) will still be useful in the year 2000, the vendor claims.

The CBX II incorporates dynamically allocatable bandwidth, which accommodates communications between two network devices on up to 192 lines, each operating at 192,000 bits per second (bps). If two devices communicate at a higher speed, their transmissions will occupy more than one channel. For example, if two devices operate at 1 Mbps, six channels with a total capacity of 1.15 Mbps can be assigned to their communications. The system's aggregate limit is 4.4 billion bits per second. The CBX II is non-blocking.

The CBX II is designed to handle

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news & comment

(Continued from page 22)

managers to avoid treating employees like machines. "We are all entitled to engage in a reasonable degree of socializing at work," he says, "and being late once in a while is understandable."

IBM's new graphics

Continuing its aggressive moves into engineering and design graphics, IBM has announced a new system that produces images with the detail of photographs. The Model 5080 system uses up to 256 hues and gray shades.

The system's 19-inch monitor has more than one million addressable points. Many of the computations required to create three-dimensional

drawings can be done at the workstation without the assistance of a host computer. A tablet input device and either mouse or stylus cursor-control devices extend the flexibility of the system.

The Model 5080 is compatible with IBM's 3250 graphics system. A monochrome version (pictured) costs $19,750. With a color display terminal and 16 colors, the price is $24,750.

Space saver

One way to conserve valuable desk space is to hang the processing unit of your personal computer on the side of the desk. The System Sidekick suspends the central processing unit of personal computers made by IBM, Digital Equipment Corp., or Texas Instruments. The cost is $79.95. For more information call Lintek Computer Accessories at (616) 241-4040.

Sony heads up wp honor roll

Text systems from eight vendors have received top honors on the Honor Roll of Word Processing Systems. The ranking of systems is issued annually by Datapro Research Corp., based on a survey of users.

The Sony Series 35 tops this year's Honor Roll, followed by Compucorp's Omega 60 and two systems from CPT. Ironically, the fifth finisher, Dictaphone, announced last October that it would stop manufacturing word processors.

The survey results reveal that a growing number of users are buying their systems, as opposed to renting or leasing them. This year, 46 percent of respondents said they had purchased multi-terminal systems, up from 38 percent the previous year. Users show little interest in adding communications capabilities to their systems, according to the results, even though such capabilities are becoming more readily available.

The latest listing is based on the ratings of more than 4,800 users of stand-alone and multi-terminal word-processing systems. The users rated systems on a number of points, including overall reliability, peripheral reliability, and performance vs. anticipated performance.

For a system to earn a spot on Datapro's list, it must be rated by at least 20 users, receive an overall-satisfaction rating of 3.2 on a scale of 4, and have no single score of less than 2.9 on the same scale.

Datapro's Honor Roll is part of "User Ratings of Word Processing Systems," a report that includes de-

(News continued on page 30)

The word-processing honor roll

	Number of users	Overall rating*	Lowest rating
Stand-alone systems			
Sony Series 35	20	3.7	3.4
Compucorp Omega 60	85	3.7	3.3
CPT 8500 Series	86	3.6	3.2
CPT 8000/8100	216	3.5	3.1
Dictaphone Dual Display**	30	3.5	3.1
CPT 6000/6100	27	3.5	3.0
NBI OASys 3000	175	3.4	3.0
Multi-terminal systems			
NBI OASys 64	76	3.6	3.2
Philips 2002	49	3.6	3.1
NBI OASys 8	73	3.5	3.1
Wang WPS 20	22	3.5	2.9
A.B. Dick Magna SL	61	3.4	3.0

**Weighted average based on a scale of 1 through 4.*
***Dictaphone no longer manufactures word-processing equipment.*

(Continued from page 26)

tailed ratings of 71 systems. The report costs $25, and is available from Datapro Research Corp., 1805 Underwood Blvd., Delran, NJ 08075. The phone number is (609) 764-0100.

More portable and personal computers

Texas Instruments, long the leader in portable printers, has finally introduced a portable personal computer—or, as TI's vice president Eric Jones calls it, a *trans*portable personal computer. Weighing about 45 pounds with two floppy-disk drives, the color version of the TI Portable Professional Computer cannot be carried comfortably under your arm. The monochrome version with one disk drive weighs 32 pounds.

Unlike many of the recently introduced portables, TI's machines, which are assembled in Japan, are not compatible with the IBM Personal Computer. However, many of the packages popularly used on the IBM PC run in MS-DOS 2.1 versions on the TI machines. The new portables cost $2,395 for monochrome, and $2,965 for color.

Xerox has introduced a number of options that fit the TI Professional and portable computers. These are: kits that expand internal memory to 768 Kbytes in 256-Kbyte increments; software that lets machines emulate a standard IBM 3276 Model 12 control unit/display station with a 3287 printer; and a numeric co-processor that accelerates calculation-intensive applications by as much as 100 times. A 10-Mbyte hard disk for the Professional was also announced, but hard disk will not be available on the portables until September.

Xerox Corp. has also unveiled its first portable computer, the Xerox 1810. The 5-pound unit can be carried in a briefcase, and will run for up to 10 hours off a built-in rechargeable battery. The 1810 is the first member of the Xerox 1800 family, but there are plenty of peripherals to enhance it. On its own, the 1810 has 64 Kbytes of memory, a three-line, 80-character LCD display, a tape recorder with a microcassette, a Basic language compiler, and automatic-dialing capabilities that manage up to 30 numbers. It also has an alarm clock, which indicates Xerox's desire to meet all the business traveler's needs. The 1810 runs CP/M software, and costs $2,195.

The color version of the TI Portable Professional Computer weighs 45 pounds and includes two floppy-disk drives.

The Commuter from Visual Computer Inc. is another IBM PC-compatible portable. It weighs 16 pounds, and comes with 128 Kbytes of memory, a 360-Kbyte floppy-disk drive, the MS-DOS 2.1 operating system, and a keyboard that looks like the IBM Personal Computer's. Greater memory and storage are optional, as is an 80-character, 16-line LCD display. The basic model costs $1,995. You can call Visual Computer at (617) 480-0000.

Televideo Systems has added a portable computer and a hard-disk desk-top system to its line of PC-compatible systems. The TPC II portable follows up the company's TPC I, an 8-bit machine that was not compatible with the IBM PC. The basic configuration with 128 Kbytes of RAM, one disk drive, and a 9-inch monitor, weighing in at 33 pounds, costs $2,995. The hard-disk system, the TS 1605H, which is not a portable, is compatible with the IBM PC-XT. Televideo's previously announced TS 1605 is compatible with the IBM PC. With 256 Kbytes of RAM, the 10-Mbyte hard disk, a 360-Kbyte floppy, and a 14-inch display, the 1605H costs $4,995.

The PC Traveler is also IBM PC-compatible. From Strategic Technologies Inc., the Traveler incorporates many rare features into its 26-pound bulk. The vendor claims its use of a plasma display is a first for personal computers. The display can be found when the lid portion of the

OFFICE AUTOMATION

And the race goes on—Part II

The era of office automation is, without a doubt, here. Once considered applicable only to large organizations, the need for and cost-effectiveness of OA are having an increasingly greater impact in smaller, single-site, companies. And typical of the U.S. marketplace—whether it be for pens, automobiles, or computers—as demand grows, more and more vendors spring up, offering the American buyer an enormous variety of products.

With all the choices that are bombarding you, how can you know what criteria to apply when deciding on a vendor? There are two important questions that small organizations facing potential growth should ask: Will the vendor survive in the current competitive climate? and, If so, will the vendor still serve our needs as our organization expands?

Last month, in Part I of this report, we addressed the importance to Fortune 1,000 companies of a vendor's five-year survivability, and reported the results of the first half of our survey. (We queried members of the Office Automation Society International, and received a total of 36 responses. In last year's survey of office-automation consultants and managers of OA projects, we received only 22 responses.) This month, we bring you the results of the second half of our survey, which considered the survivability of vendors to the smaller, single-site, companies.

The survey recipients were asked to check one of three ratings for each vendor named (there were 34 in all). The choices included "sure survivor," "likely survivor," and "not likely." In totaling the scores, a "weight" of 10 was assigned to each "sure survivor" vote, 6 to each "likely survivor" vote, and 2 to each "not likely." The highest possible score any vendor could attain was 360, but no vendor received that score because not all respondents rated every vendor. (In last year's survey, reported in the January and February 1983 issues, the highest possible score was 220.)

Keep in mind that this survey indicates knowledgeable users' *perceptions* on the survivability of vendors. It shows, by implication, which vendors will be favored enough by buyers to still be around in five years. Although it does not bear the imprimatur of any office-automation expert, it still merits attention. What users *think* about the equipment available to them will undoubtedly affect the market.

The chart that accompanies this second-half report provides total scores, as well as "sure survivor" votes, for suppliers to single-site companies. It also compares these with each company's scores in last year's survey.

> The cost-effectiveness of OA is having an increasingly greater impact in the smaller, single-site, companies.

The roster of "Top 10" vendors is surprisingly different from last year's list. In rank order of total scores, the winners are: Apple Computer (334); IBM (312); Digital Equipment Corp. (272); Wang Laboratories (256); Hewlett-Packard (230); Xerox (222); AT&T Information Systems (218); Kodak (192); Lanier (184); and Honeywell (182).

Moving up from last year's third-place spot, Apple Computer captured the top position, leaving behind such giants as IBM, Digital Equipment, and Wang. It received 31 "sure survivor," four "likely survivor," and one "not likely" vote. Apple's success might be the payoff of superb marketing; it seems to have convinced the small-business market that its product is perfect for the needs of a small organization.

IBM's Personal Computer and Displaywriter have given it almost as strong a foothold in the small-business market, and the experts think Big Blue is there to stay. Their votes of confidence included 30 "sure survivor" and two "likely survivor."

Digital Equipment Corp. has also had a strong impact, as evidenced by its move from fifth place in last year's survey to third this year.

Wang's slip from second place last year to fourth place makes one wonder about the depth of its penetration into the single-site market. The votes for this company included 21 "sure survivor," seven "likely survivor," and two "not likely."

Surprisingly, Hewlett-Packard, which was not even in the "Top 10" last year, took fifth place. Sixteen "sure survivor," 11 "likely survivor," and two "not likely" votes were cast for HP.

Although it lost ground in the Fortune 1,000 race, Xerox moved up among the single-site suppliers from seventh to sixth place.

AT&T Information Systems is also moving in a positive direction—it jumped from ninth place last year to seventh in the current survey, and picked up 16 "sure survivor" and 13 "likely survivor" votes along the way.

A new addition to the survey, Kodak, stepped right into eighth place, while Lanier slipped from sixth in last year's poll to ninth place. Honeywell, which didn't make the "Top 10" last year, squeezed into the number-10 spot over 3M.

Noticeably missing from this

year's "Top 10" roster are Tandy (Radio Shack), CPT, and NBI. This change in the lineup, coupled with Lanier's drop in status, may indicate a future trend. As equipment continues to evolve, growing still more sophisticated, support and training will become increasingly critical aspects of servicing the small-business market. This will require vendor companies of substantial size.

Therefore, the future may belong to those vendors who are already big fish—and will become even bigger by swallowing up the small fry. □

"Survivor" survey results for smaller users

Vendor*	Total score 1989	"Sure survivor" votes 1989	Total score 1988	"Sure survivor" votes 1988
Anaconda-Ericson	62	1	—	—
Anderson Jacobson	114	4	54	1
Apple Computer	334	31	162	10
AT&T Information Systems	218	16	128	10
Bell & Howell	172	11	—	—
Burroughs	180	7	70	1
CPT	160	7	124	6
Data General	170	8	70	0
Datapoint	152	4	76	1
A. B. Dick	134	3	78	1
Dictaphone**	194	9	112	2
Digital Equipment	272	19	152	12
Exxon Office Products	158	6	48	0
Hewlett-Packard	230	16	116	7
Honeywell	182	7	84	2
IBM	312	30	178	17
Kodak	192	11	—	—
Lanier	184	6	148	9
Motorola (Four Phase)	126	4	74	0
NBI	124	4	132	5
NEC	130	8	92	1
Nixdorf	88	2	60	0
Northern Telecom	162	8	74	2
Olivetti	138	5	92	2
Philips (Micom)	82	4	90	1
Prime	174	8	88	0
Raytheon (Lexitron)	90	1	78	1
Rolm	114	4	62	1
Royal	104	2	80	0
Sony	152	6	94	2
Sperry	122	3	58	1
Syntrex	98	3	74	0
Tandem	104	2	94	1
Tandy (Radio Shack)	230	14	160	10
3M	180	10	—	—
Wang Laboratories	256	21	172	16
Wordplex	84	2	26	0
Xerox	222	14	136	8

*These results show which vendors members of the Office Automation Society International think will be serving smaller, single-site, companies in five years. Vendors that received write-in votes from respondents include CPI, Kaypro, Siemens, and Texas Instruments.

**In October, Dictaphone announced its withdrawal from the word-processing business.